

CLAIMS

What is claimed is:

1. A drill guide, comprising:
a shaft having a proximal end and a distal end; and
a guide member disposed at the distal end of the shaft and operable to engage an insertion plate that maintains first and second members of an intervertebral disc replacement device in registration with one another for insertion into an intervertebral disc space of a spinal column,
wherein the guide member includes at least one guide bore operable to align with an area of a vertebral bone of the intervertebral disc space to which one of the first and second members of the intervertebral disc replacement device is to be attached.
2. The drill guide of claim 1, wherein the guide member includes a first alignment element operable to engage a second alignment element of the insertion plate and to enable a target orientation of a longitudinal axis of the guide bore relative to at least one of the vertebral bone and the one of the first and second members of the intervertebral disc replacement device.
3. The drill guide of claim 2, wherein one of the first alignment element of the guide member and the second alignment element of the insertion plate includes an alignment stem and the other of the first alignment element and the second alignment element includes an alignment bore, the alignment stem being receivable within the alignment bore to enable the target orientation of the longitudinal axis of the guide bore.
4. The drill guide of claim 3, wherein:
the first member of the intervertebral disc replacement device includes a first vertebral contact surface and a first flange including at least one through hole for receiving a bone screw for fastening the first member to the vertebral bone of the spinal column; and

the guide member of the drill guide further includes a third alignment element operable to engage the at least one through hole of the first flange when the alignment stem is received within the alignment bore to further enable the target orientation of the longitudinal axis of the guide bore.

5. The drill guide of claim 4, wherein the guide bore is disposed at least partially through the third alignment element such that the target orientation of the longitudinal axis of the guide bore is directed through the at least one through hole.

6. The drill guide of claim 3, wherein:
the guide member includes a posteriorly directed surface and a spaced apart anterior directed surface;

the first alignment element of the guide member includes the alignment bore extending from the posteriorly directed surface at least partially through the guide member toward the anteriorly directed surface; and

the second alignment element of the insertion plate includes the alignment stem extending in an anterior direction for engagement with the alignment bore.

7. The drill guide of claim 6, wherein the alignment bore has a longitudinal axis that is offset from a longitudinal axis of the shaft.

8. The drill guide of claim 6, wherein:
the first member of the intervertebral disc replacement device includes a first vertebral contact surface and a first flange including at least two through holes for receiving respective bone screws for fastening the first member to the vertebral bone of the spinal column; and

the guide member of the drill guide further includes at least third and fourth alignment elements extending transversely from the posteriorly directed surface of the guide member and each being operable to engage a respective one of the through holes of the first flange when the alignment stem is received within the alignment bore to further enable the target orientation of the longitudinal axis of the guide bore.

9. The drill guide of claim 8, wherein the guide member includes at least

two guide bores, each being disposed at least partially through respective ones of the third and fourth alignment elements such that respective target orientations of longitudinal axes of the guide bores are directed through respective ones of the through holes.

10. A drill guide, comprising:

a shaft having a proximal end and a distal end; and

a guide member disposed at the distal end of the shaft and including at least one guide bore, the guide member being operable to engage an insertion plate that maintains first and second members of an intervertebral disc replacement device in registration with one another for insertion into an intervertebral disc space of a spinal column, wherein:

the guide member is operable to achieve at least first and second alignment modes with respect to the insertion plate,

in the first alignment mode, the guide member is operable to engage the insertion plate such that the at least one guide bore aligns with an area of a first vertebral bone of the intervertebral disc space to which one of the first and second members of the intervertebral disc replacement device is to be attached, and

in the second alignment mode, the guide member is operable to engage the insertion plate such that the at least one guide bore aligns with an area of a second vertebral bone of the intervertebral disc space to which the other of the first and second members of the intervertebral disc replacement device is to be attached.

11. The drill guide of claim 10, wherein:

the guide member includes a first alignment element operable to variably engage a second alignment element of the insertion plate to achieve the first and second alignment modes;

in the first alignment mode, the first alignment element of the guide member is operable to engage the second alignment element of the insertion plate to enable a first target orientation of a longitudinal axis of the guide bore relative to at least one of the first vertebral bone and the first member of the intervertebral disc replacement device; and

in the second alignment mode, the first alignment element of the guide

member is operable to engage the second alignment element of the insertion plate to enable a second target orientation of the longitudinal axis of the guide bore relative to at least one of the second vertebral bone and the second member of the intervertebral disc replacement device.

12. The drill guide of claim 11, wherein one of the first alignment element of the guide member and the second alignment element of the insertion plate includes an alignment stem and the other of the first alignment element and the second alignment element includes an alignment bore, the alignment stem being receivable within the alignment bore to enable rotational adjustment of the guide member relative to the insertion plate and to achieve the first and second alignment modes.

13. The drill guide of claim 11, wherein:

the first member of the intervertebral disc replacement device includes a first vertebral contact surface and a first flange including at least one through hole for receiving a bone screw for fastening the first member to the first vertebral bone of the spinal column;

the second member of the intervertebral disc replacement device includes a second vertebral contact surface and a second flange including at least one through hole for receiving a bone screw for fastening the second member to the second vertebral bone of the spinal column; and

the guide member of the drill guide further includes at least a third alignment element operable to: (i) engage the at least one through hole of the first flange when the alignment stem is received within the alignment bore in the first alignment mode to further enable the first target orientation of the longitudinal axis of the guide bore, and (ii) engage the at least one through hole of the second flange when the alignment stem is received within the alignment bore in the second alignment mode to further enable the second target orientation of the longitudinal axis of the guide bore.

14. The drill guide of claim 13, wherein the guide bore is disposed at least partially through the third alignment element such that the target orientations of the longitudinal axis of the guide bore may be directed through the respective through holes in the first and second alignment modes.

15. The drill guide of claim 11, wherein:

the guide member includes a posteriorly directed surface and a spaced apart anterior directed surface;

the first alignment element of the guide member includes the alignment bore extending from the posteriorly directed surface at least partially through the guide member toward the anteriorly directed surface; and

the second alignment element of the insertion plate includes the alignment stem extending in an anterior direction for engagement with the alignment bore.

16. The drill guide of claim 15, wherein the alignment bore has a longitudinal axis that is offset from a longitudinal axis of the shaft.

17. The drill guide of claim 15, wherein:

the first member of the intervertebral disc replacement device includes a first vertebral contact surface and a first flange including at least two through holes for receiving respective bone screws for fastening the first member to the first vertebral bone of the spinal column;

the second member of the intervertebral disc replacement device includes a second vertebral contact surface and a second flange including at least two through holes for receiving respective bone screws for fastening the second member to the second vertebral bone of the spinal column; and

the guide member of the drill guide further includes at least a third and fourth alignment elements each operable to: (i) engage a respective one of the through holes of the first flange when the alignment stem is received within the alignment bore in the first alignment mode, and (ii) engage a respective one of the through holes of the second flange when the alignment stem is received within the alignment bore in the second alignment mode.

18. The drill guide of claim 17, wherein the guide member includes at least two guide bores, each being disposed at least partially through respective ones of the third and fourth alignment elements such that

in the first alignment mode, first and second longitudinal axes of the guide

bores are directed through respective ones of the through holes of the first flange of the first member of the intervertebral disc replacement device

in the second alignment mode, first and second longitudinal axes of the guide bores are directed through respective ones of the through holes of the second flange of the second member of the intervertebral disc replacement device.

19. A method for replacing at least a portion of an intervertebral disc in a spinal column, comprising the steps of:

removing the portion of the intervertebral disc from the spinal column; and
inserting first and second members of an intervertebral disc replacement device into an intervertebral disc space of the spinal column, the first and second members being detachably engaged with an insertion plate operable to substantially maintain the first and second members in registration with one another;

attaching a drill guide to the insertion plate, the drill guide including a shaft having a proximal end and a distal end, and a guide member disposed at the distal end of the shaft that is operable to engage the insertion plate;

inserting a drill bit through at least one guide bore of the guide member to align the drill bit with an area of a vertebral bone of the intervertebral disc space to which one of the first and second members of the intervertebral disc replacement device is to be attached; and

drilling the vertebral bone.

20. The method of claim 19, further comprising the step of using the drill guide to urge the first and second members of the intervertebral disc replacement device into a target position within the intervertebral disc space before drilling the vertebral bone.

21. The method of claim 19, further comprising the steps of:

orienting the guide member into a first alignment mode with respect to the insertion plate such that the at least one guide bore aligns with an area of a first vertebral bone of the intervertebral disc space to which the first member of the intervertebral disc replacement device is to be attached;

drilling the first vertebral bone;

orienting the guide member into a second alignment mode with respect to the insertion plate such that the at least one guide bore aligns with an area of a second vertebral bone of the intervertebral disc space to which the second member of the intervertebral disc replacement device is to be attached; and
drilling the second vertebral bone.

22. The method of claim 21, further comprising the step of fixing the first member of the intervertebral disc replacement device to the first vertebral bone prior to drilling the second vertebral bone.

23. The method of claim 21, wherein:

the guide member includes a first alignment element operable to variably engage a second alignment element of the insertion plate to achieve the first and second alignment modes;

the first member of the intervertebral disc replacement device includes a first vertebral contact surface and a first flange including at least one through hole for receiving a bone screw for fastening the first member to the first vertebral bone of the spinal column; and

the method further comprises (i) engaging at least a third alignment element of the guide member with the at least one through hole of the first flange when the first alignment element engages the second alignment element in the first alignment mode, and (ii) drilling the first vertebral bone.

24. The method of claim 22, wherein:

the second member of the intervertebral disc replacement device includes a second vertebral contact surface and a second flange including at least one through hole for receiving a bone screw for fastening the second member to the second vertebral bone of the spinal column; and

the method further comprises (i) variably engaging the first alignment element and the second alignment element to achieve the second alignment mode, (ii) engaging at least the third alignment element of the guide member with the at least one through hole of the second flange, and (iii) drilling the second vertebral bone.